

AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0002] of the specification as follows:

[0002] The present invention is directed to a novel protocol for an ad-hoc, peer-to-peer radio network system having coordinating channel access to shared parallel data channels via a separate reservation channel. This system is disclosed in United States Patent Number 6,404,756, granted on June 11, 2002, ~~co~~pending application Ser. No. 09/705,588, filed on Nov. 3, 2001, entitled "Methods and Apparatus for Coordinating Channel Access to Shared Parallel Data Channels", which application is incorporated by reference herein in its entirety.

Please amend paragraph [0003] of the specification as follows:

[0003] The network system having coordinating channel access to shared parallel data channels via a separate reservation channel of United States Patent Number 6,404,756 ~~co~~pending application Ser. No. 09/705,588 is directed to a network system, such as radio network, where each node, or radio terminal, of the network is capable of serving as a node or hop of a routing path of a call from another, or to another radio terminal. In that system, communication between nodes or radio terminals is achieved using Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) protocol with the addition of multiple parallel data channels serviced by one reservation channel. By dedicating a separate reservation channel for the multiple parallel data channels, collision-free access by all of the competing nodes or terminals of the service group of the network is greatly reduced. Communications between terminals or nodes is set up by information exchanged on the separate reservation channel, which information includes all of the call set-up information such as data channel desired to be used for transferring voice, video or data, the desired power level of at least initial transmission, messaging such as Request-to-Send (RTS), Clear-to-Send (CTS), Not-Clear-to-Send (NCLS), Acknowledgment (ACK) for indicating reception of the transmitted call, Non-Acknowledgment (NACK) for indicating improper reception of the call, etc. In this system, in order to further ensure fast, adequate and collision-free transmission and reception, besides a primary modem typically provided with the transceiver of each node or terminal, a secondary modem is also provided which is dedicated to the reservation channel when the primary modem of the transceiver is occupied, such as when sending out data on a data channel. This system also provides for collision free transmission and

reception between nodes or terminals by transmitting the reservation and data channels in time slots of time frames, with the information as to which time slot is to be used being included in the messaging transmitted by the reservation channel. Such a format not only provides collision-free transmission, but also allows for Quality-of-Service (QoS) for different types of Class-of-Service (CoS). Thus, not only may voice and video be transmitted, besides data, but voice and data transmission may be prioritized, so that when competing calls vie for a data channel, the delay-dependent voice or video transmissions will take precedence. This prioritization is accomplished by assigning prioritized calls for transmission in earlier time slots of a time frame.

Please amend paragraph [0004] of the specification as follows:

[0004] The network system disclosed in United States Patent Number 6,404,756 U.S. application Ser. No. 09/705,588 ensures that every node or terminal of a service set of terminals has the most information regarding all of other terminals of that service set, so that the choice of data channel to be used, any required delay is transmitting the call, information on power level, and the like, are checked and updated by each terminal by a practically continuous monitoring of the reservation channel.

Please amend paragraph [0005] of the specification as follows:

[0005] As explained above, the system disclosed in United States Patent Number 6,404,756 U.S. application Ser. No. 09/705,588 utilizes protocol that provides collision-free channel access, which also emphasizes improving geographic reuse of the frequency spectrum.

Please amend paragraph [0007] of the specification as follows:

[0007] In commonly-owned United States Patent Number 6,873,839, issued March 29, 2005, entitled Prioritized Routing For An Ad-Hoc, Peer-To-Peer Mobile Radio Access System" provisional application serial No. 60/248,182, which application is incorporated by reference herein, there is disclosed an ad-hoc, peer-to-peer radio system for use as a stand-alone system that is also connected to a cellular network and/or PSTN. The ad-hoc mobile radio networking system thereof is capable of receiving and transmitting voice, data and video calls through any number of different types of telecommunication networks, such as the PSTN, the Internet, and the like, besides the cellular and next-generation cellular networks.

Please amend paragraph [0010] of the specification as follows:

[0010] Unlike the personal communication radio system of U.S. Pat. No. 5,943,322, [---] Mayer, et al., the Time-Division Protocol (TDP) of the present invention does not care about the modem-type of access to radio spectrum, and is designed to work with or without a base station or gateway, since modem functionality is not part of the TDP of the present invention. The protocol of the present invention uses one control/configuration channel and three or more data channels, where communication between radio terminals is planned for preventing interference. Time synchronization is independent of the communication,, whereby no collisions among terminals are possible for configuration data, excepting in the last time slot, and no collisions are possible in the data channels, as described above. The protocol of the present invention may transmit data and video, in addition to voice, since each is just another class of data.

Please amend paragraph [0011] of the specification as follows:

[0011] The system of the present invention is much more complex due to multiple, parallel data channels that are coordinated by a single reservation channel. In this system, a combination of CSMA/CA, TDMA (time division multiple access), FDMA (frequency division multiple access), and CDMA (code division multiple access) is used within the channel access algorithm. The transceiver used in the system employs two modems to solve the channel reliability issues with multiple channel designs, as disclosed in the above-described copending U.S. application Ser. No. 09/705,588. Specifically, the system dedicates a receive-only modem for gathering channel usage information on the reservation channel. The reservation channel operates a hybrid CSMA/CA and TDMA algorithm. The remainder of the protocol uses FDMA for the multiple data channels, and CDMA for multiple users on the same data channel.

Please amend paragraph [0012] of the specification as follows:

[0012] Reference is also had to ~~copending~~, commonly-owned United States Patent Number 6,873,839, issued March 29, 2005, U.S. patent application serial No. 09/_____, filed on _____, 2001, entitled "Prioritized-Routing for an Ad-Hoc, Peer-to-Peer, Mobile Radio Access System", which is incorporated by reference herein, in which there is disclosed an example of routing table messaging which may be used in the present invention.

Please amend paragraph [0016] of the specification as follows:

[0016] The system of the present invention utilizes a method and algorithm which, in the preferred embodiment, is intended for an ad-hoc network system called "ArachNet", and is based on least-energy routing of calls from between network radio terminals. In simple terms, the major component of the routing decision is to choose the route to the destination that uses the least amount of energy over the complete route. The major reason for this is that least-energy routing minimizes the radiated RF energy, in order to reduce interference between terminal A. Consequently, this creates the most efficient use of the power supply of the terminals. Routing tables based on this least energy routing are developed by the system of the invention, and stored at one or more radio terminals, which routing tables are transmitted and stored by other terminals forming part of the link by which a call is connected. An example of such a routing table is disclosed in ~~expending~~, commonly-owned United States Patent Number 6,873,839, issued March 29, 2005, U.S. patent application Ser. No. 09/_____, filed on _____, 2001, entitled "Prioritized-Routing for a Ad-Hoc, Peer-to-Peer, Mobile Radio Access System", which is incorporated by reference herein.

Please amend paragraph [0017] of the specification as follows:

[0017] Variants or equivalents of the system of the invention are possible. There are a number of variants of this approach that would provide acceptable performance. These variants include tuning of each of the four access schemes, ~~[[--]]~~ CSMA/CA, TDMA, FDMA, and CDMA. For example, the width of the time slots may be adjusted based on the specific network over which the protocol is executing. Performance of the network is very dependent on the number of parallel data channels which can be used. A balance exists between the capacity of the reservation channel to make data reservations and the capacity of the data channels to provide service. This balance is dependent on the underlying capabilities of the dedicated, reservations-channel modem that implements the protocol. The performance of the protocol is also dependent on the inclusion of the channel quality extracted from the channel. Accurate estimates of the signal strength translate into improvements in geographic reuse, which can be obtained by aggressive power control schemes. Another example is the use of advancements in the codes used within the CDMA portion. Codes which improve the cross-correlation performance of

terminals which share a common data channel improve the throughput and reliability of the overall network performance.

Please amend paragraph [0020] of the specification as follows:

[0020] While the protocol method of the present invention is disclosed with regard to an ad-hoc, peer-to-peer radio system, the protocol is equally applicable to any wireless LAN, wireline network, and the like, to which the method and system disclosed in United States Patent Number 6,404,756 ~~co~~pending U.S. application Ser. No. 09/705,588 may apply.

Please amend paragraph [00130] of the specification as follows:

[0130] The protocol of the present invention is based on least energy routing determination, as discussed previous especially when transmitting data. The routing table messaging that is exchanged between ~~terminals~~ terminals may have a format as that disclosed in ~~co~~pending, commonly-owned United States Patent Number 6,873,839, issued March 29, 2005, U.S. patent application Ser. No. 09/_____, filed on _____, 2001, entitled "Prioritized-Routing for an Ad-Hoc, Peer-to-Peer, Mobile Radio Access System", which is incorporated by reference herein.

Please amend paragraph [00131] of the specification as follows:

[0131] ~~of the protocol of the invention is used to set up the optimal path of a call.~~ The following algorithm of the protocol of the present invention is based on this minimum energy routing.